

Philad^a 14th July 1833

Dear Sir

In reply to your communication of the 14th Inst. I beg to state that I have experimented sufficiently on forms of apparatus to be satisfied that others can be employed beside the revolving method of Evans' Patent. For one of these methods I have adopted the movement of Prof.

Bachet, modifying it in two ways, so as to allow of the resetting of the apparatus, when it has been moved by the fusion of the metal. Another is by a semi-revolution in the fusing metal. The third method is by the improved form of the simple plug, which, as I suggested in a recent letter to the department, may be used for all the higher pressures.

The greatest difficulty I experience at present is that of devising the best form of apparatus for applying the two first methods, and my inefficiency in this respect is due, I regret to say, to my hitherto exclusive devotion to chemical pursuits to the neglect of mechanical.

After being satisfied that the methods alluded to will operate and probably as well as Evans' Patent, I described them to a mechanic of this City, Mr J. Bishop, and have desired him to construct one a week or two since. This is all the progress I have made in respect to the apparatus, but it is as much as it was in my power to do at present.

Mr Hile on this subject, permit me to suggest a course of action which will be likely to lead to useful results. I would propose my making to the department a formal report on the methods of employing the alloys, accompanied by illustrative

drawings; in order that they may be communicated to the supervising inspectors, and by them be distributed to machinists. It appears to me that such a course would ~~draw~~^{call} into the field a large amount of ingenuity and skill, which will lead to the construction of more perfect apparatus than has been hitherto devised. I was led to this view from a long conference I held with the supervising inspector of Cincinnati, Mr Clayford, (or Mr Pittsburg) during which he mentioned some improvements effected in Coast Guard by a machinist in Cincinnati. One of these improvements I had already adopted in our test boiler. If the whole subject were thrown open to the public, much more valuable suggestions would probably be made, than my imperfect mechanical abilities can command.

In regard to the alloys, I have ceased to manufacture them having a good stock on hand ready for delivery. After ceasing the manufacture more than a month since, I employed Mr Garrett and John Rogers to experiment on a new set of alloys, to which I alluded in a former letter. I have succeeded in this, ^{not} beyond my expectation. The new alloys differ materially from the others, and were designed for temperatures below 110° or 120° Fahr. By means of the two sets of alloys, I think at present that the simple plug may be used with as much reliability, as any more complex forms of apparatus for all pressures above 80 or 90 lbs. as a machine. During the next two months, I do not perceive that I can do much in connection with the fusible alloys, except to make some experiments on composition and to procure a working model of the forms of apparatus I have proposed. I would prefer having at least one of these made, and to submit

them with drawings to the Board of Inspectors. For the past two weeks I have been much occupied in making the preliminary arrangements for rendering the interior of the munt fire-proof and have neglected to send forward my quarterly accounts of the operations on fusible metals. I shall supply this deficiency in a few days.

I have the honor to be, dear sir
Yours faithfully
Hon. Jas Guthrie
Secretary of the Treasury
Washington D.C.

Yr obt. Svt.
Jas C. Booth

1855
July 14th
J.C.B. to Sec. Treas.